

# Laparoscopic cost effective management of cholecystoduodenal fistula

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## Abstract

**Introduction:** Contraindication to laparoscopic surgery is decreasing with time, expertise and innovation. One such uncommon condition is cholecystoduodenal fistula (CDF), now increasingly managed with laparoscopic technique. We are reporting eight such incidentally diagnosed cases during laparoscopic operation, which were successfully and cost-effectively managed with traditional laparoscopic instruments.

**Materials and Methods:** During March 2008 to March 2017, 1500 patient underwent laparoscopic cholecystectomy for benign gall bladder condition or their complications, eight of these having chronic dyspeptic symptoms of gallstone, were found to have cholecystoduodenal fistula, intraoperatively. All cases were managed laparoscopically using common laparoscopic instruments without any special gadgets and extra costs. Medical records of eight cases were reviewed for age, sex, operative technique, intra and post-operative complications and length of stay in hospital.

**Results:** Five patients were male and three were female with a mean age of 63 years. All of them had gall stones at abdominal ultrasound and cholecystoduodenal fistula were found intraoperatively. Fistula tract was dissected, cleaned and sealed with combination of intracorporeal simple transfixation ligation and interrupted stitches to invert the stump within the duodenal wall in transverse fashion. All eight had uneventful postoperative course with hospital stay of 4-7 (mean 5) days.

**Conclusion:** In expert hands cholecystoduodenal fistula can successfully and safely be managed laparoscopically using common instruments and logistics with slight modification of open technique without extra cost.

**Key words:** Cholecystoduodenal fistula (CDF), Cholecystoenteric fistula (CEF), laparoscopic technique.

## Introduction:

Since the first successful case in 1982, laparoscopic cholecystectomy (LC) has become the favored treatment as well accepted by surgeons and patients for gall bladder lesions worldwide<sup>1</sup>. With time and increasing experience laparoscopic cholecystectomy has successfully been attempted in all kinds of benign gall bladder pathology<sup>5</sup> and their complications. One such condition is cholecystoenteric fistula (CEF), an abnormal spontaneous tract with bile drainage from the gall bladder to one or more adjacent bowel loop. It is though uncommon, a well-recognized complication

of gall stone disease (75%)<sup>2,3</sup> but can be due to peptic ulcer or neoplasm<sup>4</sup>. During acute cholecystitis adjacent serosal surface become inflamed and adherent of gall bladder. Raised intra cholecystic pressure and gangrene of gall bladder wall leads to penetration of bile to bowel, forming cholecystoduodenal fistula<sup>5</sup>. Its incidence has been reported as 3-5% in cholelithiasis and 0.15-4.8% among patients who undergo biliary tract surgery<sup>6</sup>. Cholecystoduodenal type (CDF) has the highest incidence (up to 80%) among cholecystoenteric fistula. The symptoms of cholecystoduodenal fistula are non-specific, often resemble those due to gall stone<sup>3</sup>, rarely diagnosed pre-operatively and almost always discovered during cholecystectomy<sup>6</sup>. At inception of laparoscopic surgery cholecystoduodenal fistula was considered an absolute contraindication for laparoscopic cholecystectomy. Now it is a relative contraindication to laparoscopic cholecystectomy, while it is not a contraindication to some surgeons<sup>6,8</sup>. Now increasing number of surgeons are managing cholecystoduodenal fistula laparoscopically with a conversion rate of 58.8%. Laparoscopic stapling techniques are used to seal the fistula and have been proved to be flexible and safe method<sup>2,3,9</sup>. However, stapling devices are expensive, not always available and require certain level of expertise of the surgeon. We are reporting eight cases of cholecystoduodenal fistula managed successfully by laparoscopic ligation and suture technique using traditional laparoscopic instruments. All these cases were discovered during an attempt to perform laparoscopic cholecystectomy.

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**Materials and methods:**

From march 2008 to march 2017, 1500 patients underwent laparoscopic cholecystectomy for gall stone disease in a surgical unit of BIRDEM general hospital, Dhaka, Bangladesh. Eight of them (0.53%) were found intraoperatively to have cholecystoduodenal fistula, abnormal communication between gall bladder and the first part of the duodenum. We, retrospectively, reviewed the medical records of eight patients of cholecystoduodenal fistula. All the patients history were recorded and underwent physical examination, ultrasonography (USG), and biochemical tests to establish a preoperative diagnosis. USG revealed, fibrosed, contracted, thick walled gallbladder with stones in all cases. In each case laboratory findings were unremarkable. Data were collected on patients' age, sex, preoperative diagnosis, operative methods, morbidity and length of stay in hospital. Surgery was performed under general anesthesia using standard four ports technique. Cholecystoduodenal fistula was clearly demonstrated after careful blunt and sharp dissection. (Figure-1) Gall bladder end of the fistula tract was sealed with metal clip and the duodenal end was closed with a transfixation ligature and a simple ligature proximal to that. The cholecystoduodenal fistula was divided between ligature and clip. Duodenal end of the tract was inverted by three interrupted intracorporeal stitch within the duodenal wall in transverse fashion. Rest of the surgery was completed in usual manner of laparoscopic cholecystectomy. Oral diet was resumed 48 hours after surgery. Patients were followed up in the outpatient clinic 7 days and one month after surgery.

**Results:**

Cholecystoduodenal fistulas were diagnosed in 8 of 1500 patients (0.53%) over the last 9 years by a single surgeon. Five were male and three were female patients with age ranging from 54 to 69 years (mean 63 years). They had gall stones detected by abdominal Ultrasonography. Cholecystoduodenal fistula was found during operative treatment of gall stones. All the cases were managed laparoscopically. Cholecystoduodenal fistula was completely mobilized with a combination of blunt and sharp dissection and divided after application of metal clip at gall bladder end and intracorporeal transfixation ligature and simple ligature. Duodenal end was inverted by intracorporeal interrupted seromuscular suture of duodenal wall in a transverse manner. After that, laparoscopic cholecystectomy was completed. There were no intraoperative complications in any of the patients. None of the cholecystoduodenal fistula was caused by malignancy. All eight patients had uneventful post-operative course. The hospital stay of eight patients ranged from 4 to 7 days (mean 5days). Follow up was scheduled at 7<sup>th</sup> post-operative day and at one month with an advice to report in need. None returned with a complication.

**Discussion:**

According to international publications, cholecystoenteric fistulas are more common in female geriatric population<sup>6</sup>. Contrary to this, in our study, elderly male predominate over females (5 vs. 3). There were no specific symptoms

suggestive of cholecystoduodenal fistula, rather chronic dyspeptic symptoms are indistinguishable from those of non-complicated calculus chronic cholecystitis. Thus, the diagnosis is made intraoperatively unless ultrasonography shows pneumobillia or there is an indication for more advanced diagnostic exercise like CT scan, MRCP or ERCP. In pre-laparoscopic era the standard treatment for this condition was open cholecystectomy with closure of the fistula with excision. With the advancement in video laparoscopic surgery many reports have described laparoscopic approach for cholecystoduodenal fistula<sup>6</sup>. The strategy and techniques used in open surgery are also applicable in laparoscopic operations. Prompt recognition is crucial along with meticulous preparation of the fistula site to demonstrate surrounding anatomy. The endoscopic stapling device appeared to be easy to use and effective in closure of cholecystoduodenal fistula. But it is expensive and not available in resource constrained areas where it is needed for an incidental occasion. Ligation of the fistula with an endoloop is another option. Though unreliable and loss of control over divided fistula stump may create a technical difficulty during application<sup>2,9</sup>. Making a simple ligation either intracorporeally or extracorporeally is time consuming and cannot secure fistula closure<sup>9</sup>. An alternative is applying laparoscopic intracorporeal interrupted or continuous suture closure of the fistula. Similar to those in open procedure, again there is risk of loss of control outside the laparoscopic field of view. We solved the problem by combining, a transfixation ligature and holding it for control, a simple ligature proximal to it to avoid leak though needle prick for transfixation followed by simple interrupted seromuscular inversion suture and finally ends of transfixation ligature were cut. This technique is technically demanding but safe and effective.

**Conclusion:**

The standard treatment of cholecystoduodenal non-malignant fistula was open cholecystectomy and suture closure of fistula in pre-laparoscopic era. With increasing expertise contraindications of laparoscopic surgery in such rare complications of gall stone that are discovered at operation are decreasing. A little modification of technique of open surgery have been used successfully in laparoscopic surgery without intraoperative and postoperative complications with all the advantages that minimally invasive surgery offers using traditional instruments. Thus keeping the expenditure no more than laparoscopic cholecystectomy alone.

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Figure 1:

1-Anatomy of cholecystoduodenal fistula

2-Metal clip ligation at gall bladder end, intracorporeal transfixation ligature and simple ligature at duodenal end

3-Fistula transection after ligature placement

4-Duodenal end inverted by intracorporeal interrupted seromuscular suture

